

WHAT IS CLAIMED IS:

1. An ink jet record head comprising:
  - a plurality of nozzles through which liquid flows;
  - 5 a supply chamber for supplying the liquid to each of the nozzles; and
  - a plurality of discharge ports which are nozzle end openings for discharging a liquid droplet, wherein said nozzle has:
    - 10 a flow path composition substrate comprised of a bubbling chamber in which a bubble is generated by a discharge energy generating element for generating thermal energy for discharging the liquid droplet, discharge port portions including said discharge
    - 15 ports and communicating between said discharge ports and said bubbling chamber and a supply path for supplying the ink to the bubbling chamber; and
    - an element substrate on which said discharge energy generating element is provided and joining
    - 20 said flow path composition substrate with the principal surface, and
    - wherein said discharge port portion has:
      - a first discharge port portion of an almost fixed diameter including said discharge port; and
      - 25 a second discharge port portion contiguous to the first discharge port portion and communicating in steps with said first discharge port portion and said

bubbling chamber respectively, and

a boundary portion between said second  
discharge port portion and said bubbling chamber and  
the boundary portion between said second discharge  
5 port portion and said first discharge port portion  
are continuously formed by a wall having a curvature.

2. The ink jet record head according to claim 1,  
wherein said second discharge port portion has a wall  
10 vertical to the principal surface of said element  
substrate and contiguous to the wall having said  
curvature in the boundary portion between said second  
discharge port portion and said bubbling chamber.

15 3. The ink jet record head according to claim 1,  
wherein said nozzles are formed by orthogonalizing a  
discharge direction in which liquid droplets fly from  
the discharge port and a flow direction of the liquid  
flowing in said supply path.

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4. The ink jet record head according to claim 2,  
wherein said nozzles are formed by orthogonalizing a  
discharge direction in which liquid droplets fly from  
the discharge port and a flow direction of the liquid  
25 flowing in said supply path.

5. The ink jet record head according to claim 1,

wherein said flow path composition substrate has a plurality of said discharge energy generating elements and a plurality of said nozzles, and is equipped with a first nozzle sequence having the  
5 nozzles in a longitudinal direction arranged in parallel and a second nozzle sequence having the nozzles in the longitudinal direction arranged in parallel at positions opposed to the first nozzle sequence across said supply chamber respectively  
10 while the nozzles in the second nozzle sequence are arranged so that the pitches among the adjacent nozzles are mutually deviated by a 1/2 pitch against the nozzles in the first nozzle sequence.

15           6. The ink jet record head according to claim 1, wherein the bubbles generated by said discharge energy generating element communicate with the outside air by passing through said discharge port.

20           7. The ink jet record head according to claim 2, wherein the bubbles generated by said discharge energy generating element communicate with the outside air by passing through said discharge port.

25           8. The ink jet record head according to claim 3, wherein the bubbles generated by said discharge energy generating element communicate with the

outside air by passing through said discharge port.

9. The ink jet record head according to claim 4,  
wherein the bubbles generated by said discharge  
5 energy generating element communicate with the  
outside air by passing through said discharge port.

10. The ink jet record head according to claim  
5, wherein the bubbles generated by said discharge  
10 energy generating element communicate with the  
outside air by passing through said discharge port.